

Amendments to the Claims:

This listing of claims replaces all prior versions of the claims in the application.

Claims 1-7 (canceled)

8. (withdrawn) A peptide-cargo complex comprising a peptide and a cargo wherein the peptide has an amino acid sequence selected from the group consisting of KRIIQRILSRNS (SEQ ID NO:1), KRIHPRLTRSIR (SEQ ID NO:2), PPRLRKRRQLNM (SEQ ID NO:3), PIRRRKKLRRLK (SEQ ID NO:4), RRQRRTSKLMKR (SEQ ID NO:5), MHKRPTTPSRKM (SEQ ID NO:6), RQSRRRPLNIR (SEQ ID NO:7), RIRMIQNLIKKT (SEQ ID NO:8), SRRKRQRSNMRI (SEQ ID NO:9), QRIRKSKISRTL (SEQ ID NO:10), PSKRLHNNLRR (SEQ ID NO:11), HRHIRRQSLIML (SEQ ID NO:12), PQNRLQIRRHKS (SEQ ID NO:13), PPHNRIQRRLNM (SEQ ID NO:14), SMLKRNHSTSNR (SEQ ID NO:15), GSRHPSLIIPRQ (SEQ ID NO:16), SPMQKTMNLPPM (SEQ ID NO:17), NKRILIRIMTRP (SEQ ID NO:18), HGWZIHGLLHRA (SEQ ID NO:25), AVPAKKRZKSV (SEQ ID NO:26), PNTRVRPDVSF (SEQ ID NO:27), LTRNYEAWVPTP (SEQ ID NO:28), SAETVESCLAKSH (SEQ ID NO:29), YSHIATLPFTPT (SEQ ID NO:30), SYIQRTPTSTLP (SEQ ID NO:31), AVPAENALNNPF (SEQ ID NO:32), SFHQFARATLAS (SEQ ID NO:33), QSPTDFTFPNPL (SEQ ID NO:34), HFAAWGGWSLVH (SEQ ID NO:35), HIQLSPFSQSWR (SEQ ID NO:36), LTMPSDLQPVLW (SEQ ID NO:37), FQPYDHFAEVSYS (SEQ ID NO:38), FDPFFWKYSPRD (SEQ ID NO:39), FAPWDTASFMLG (SEQ ID NO:40), FTYKNFFWLPEL (SEQ ID NO:41), SATGAPWKMWVR (SEQ ID NO:42), SLGWMLPFSPPF (SEQ ID NO:43), SHAFTWPTYLQL (SEQ ID NO:44), SHNWLPLWPLRP (SEQ ID NO:45), SWLPYPWHVPSS (SEQ ID NO:46), SWWTPWHVHSES (SEQ ID NO:47),

SWAQHLSLPPVL (SEQ ID NO:48), SSSIFPPWLSFF (SEQ ID NO:49),  
LNVPPSWFLSQR (SEQ ID NO:50), LDITPFLSLTLP (SEQ ID NO:51), LPHPVLHMGPLR  
(SEQ ID NO:52), VSKQPYWMWNGN (SEQ ID NO:53), NYTTYKSHFQDR (SEQ ID  
NO:54), AIPNNQLGFPEK (SEQ ID NO:55), NIENSTLATPLS (SEQ ID NO:56),  
YPYDANHTRSPT (SEQ ID NO:57), DPATNPGPHFPR (SEQ ID NO:58), TLPSPALLTVH  
(SEQ ID NO:59), HPGSPFPPEHRP (SEQ ID NO:60), TSHTDAPPARSP (SEQ ID NO:61),  
MTPSSLSTLPWP (SEQ ID NO:62), VLGQSGYLMPMR (SEQ ID NO:63), QPIITSPYLPS  
(SEQ ID NO:64), TPKTMTQTYDFS (SEQ ID NO:65), NSGTMQSASRAT (SEQ ID NO:66),  
QAASRVENYMR (SEQ ID NO:67), HQHKPPPLTNNW (SEQ ID NO:68),  
SNPWDSLLSVST (SEQ ID NO:69), KTIEAHPYYAS (SEQ ID NO:70),  
EPDNWSLDFPRR (SEQ ID NO:71), HQHKPPPLTNNW (SEQ ID NO:72)  
GVVGKLGQRRTKKQRRQKK (SEQ ID NO:73),  
GRRTKKQRRQKKPPRYMILGLLALAAVCSAA (SEQ ID NO:74) and  
GRRTKKQRRQKKPP (SEQ ID NO:75).

9. (withdrawn) The peptide-cargo complex of claim 8 wherein the cargo is  
selected from the group consisting of a polynucleotide, a polypeptide, a small molecule, a virus,  
a modified virus, a viral vector, and a plasmid.

10. (withdrawn) The peptide-cargo complex of claim 9 wherein the cargo is a  
virus selected from the group consisting of adenovirus, adeno-associated virus, herpes simplex  
virus, and retrovirus.

11. (withdrawn) The peptide-cargo complex of claim 8 wherein the cargo is selected from the group consisting of therapeutic proteins, suicide proteins, tumor suppressor proteins, transcription factors, kinase inhibitors, kinases, cell cycle regulatory proteins, apoptotic proteins, anti-apoptotic proteins, viral antigens, cellular antigens, differentiation factors, immortalization factors and toxins.

12. (withdrawn) The peptide-cargo complex of claim 8 wherein the peptide facilitates cellular internalization of cargo linked thereto.

13. (withdrawn) The peptide-cargo complex of claim 12 wherein the peptide provides for nuclear translocation of said peptide-cargo complex in a target cell.

14. (withdrawn) The peptide-cargo complex of claim 8 wherein the peptide has the amino acid sequence KRIHPRLTRSIR (SEQ ID NO:2).

15. (withdrawn) The peptide-cargo complex of claim 8 wherein the peptide has the amino acid sequence PPRLRKRRQLNM (SEQ ID NO:3).

16. (withdrawn) The peptide-cargo complex of claim 8 wherein the peptide has the amino acid sequence PIRRRKKLRRLK (SEQ ID NO:4).

17. (withdrawn) The peptide-cargo complex of claim 8 wherein the peptide has the amino acid sequence RRQRRTSKLMKR (SEQ ID NO:5).

18. (withdrawn) The peptide-cargo complex of claim 8 wherein the peptide is biotinylated and the cargo is avidin labeled.

19. (withdrawn) The peptide-cargo complex of claim 11, wherein the cargo is an apoptotic protein selected from the group consisting of p53, caspase-3, HSV thymidine kinase and an antimicrobial peptide.

20. (withdrawn) The peptide-cargo complex of claim 19, wherein the antimicrobial peptide is selected from the group consisting of KLAKLAK (SEQ ID NO:22) and KLAKLAKKLAKLAK (SEQ ID NO:23).

21. (withdrawn) The peptide-cargo complex of claim 19 wherein having an amino acid sequence RRQRRTSKLMKRGGKLAKLAKKLAKLAK (SEQ ID NO:24).

22. (withdrawn) The peptide-cargo complex of claim 8 wherein the cargo is glutathione.

23. (withdrawn) A method for identifying peptides capable of cellular internalization of cargo linked thereto, said method comprising:

- incubating a target cell with a peptide display library;
- isolating internalized peptides presented by said peptide display library from said target cells and identifying said peptides;
- synthesizing said peptides;
- linking said peptides to cargo to form a peptide-cargo complex;
- incubating said peptide-cargo complex with a target cell; and
- determining the ability of said peptide to facilitate the cellular internalization of said cargo into said target cell.

24. (withdrawn) The method of claim 23 further comprising determining the ability of said peptide to facilitate the nuclear localization of said cargo.

25. (withdrawn) The method of claim 23 wherein said peptide display library is an M13 phage display library.

26. (withdrawn) The method of claim 25 wherein said phage display library comprises peptides which comprise 12 amino acids.

27. (withdrawn) The method of claim 23 further comprising biotin labeling the peptides during or after said synthesis of the peptides.

28. (withdrawn) The method of claim 23 further comprising avidin labeling the cargo.

29. (withdrawn) The method of claim 23 wherein the cargo is selected from the group consisting of a polynucleotide, a polypeptide, a small molecule, a virus, a modified virus, a viral vector, and a plasmid.

30. (withdrawn) An expression cassette comprising a DNA encoding a fusion protein comprising a leader sequence, a protein of interest and an internalizing peptide having an amino acid sequence selected from the group consisting of KRIHQRILSRNS (SEQ ID NO:1), KRIHPRLTRSIR (SEQ ID NO:2), PPRLRKRRQLNM (SEQ ID NO:3), PIRRRKKLRRLK (SEQ ID NO:4), RRQRRTSKLMKR (SEQ ID NO:5), MHKRPTTPSRKM (SEQ ID NO:6), RQSRRRRPLNIR (SEQ ID NO:7), RIRMIQNLIKKT (SEQ ID NO:8), SRRKRQRSNMRI (SEQ ID NO:9), QRIRKSKISRTL (SEQ ID NO:10), PSKRLHNNLRR (SEQ ID NO:11),

AP32573-AA 072396.0203  
PATENT

HRHIRRQSLIML (SEQ ID NO:12), PQNRLQIRRHSH (SEQ ID NO:13), PPHNRIQRRLNM  
(SEQ ID NO:14), SMLKRNHSTSNR (SEQ ID NO:15), GSRHPSLIIPRQ (SEQ ID NO:16),  
SPMQKTMNLPPM (SEQ ID NO:17), NKRILIRIMTRP (SEQ ID NO:18), HGWZIHGLLHRA  
(SEQ ID NO:25), AVPAKKRZKSV (SEQ ID NO:26), PNTRVRPDVSF (SEQ ID NO:27),  
LTRNYEAWVPTP (SEQ ID NO:28), SAETVESCLAKSH (SEQ ID NO:29), YSHIATLPFTPT  
(SEQ ID NO:30), SYIQRTPSTTLP (SEQ ID NO:31), AVPAENALNNPF (SEQ ID NO:32),  
SFHQFARATLAS (SEQ ID NO:33), QSPTDFTFPNPL (SEQ ID NO:34), HFAAWGGWSLVH  
(SEQ ID NO:35), HIQLSPFSQSWR (SEQ ID NO:36), LTMPSDLQPVLW (SEQ ID NO:37),  
FQPYDHAEVSY (SEQ ID NO:38), FDPFFWKYSPRD (SEQ ID NO:39),  
FAPWDTASFMLG (SEQ ID NO:40), FTYKNFFWLPEL (SEQ ID NO:41),  
SATGAPWKMWVR (SEQ ID NO:42), SLGWMLPFSPPF (SEQ ID NO:43),  
SHAFTWPTYLQL (SEQ ID NO:44), SHNWLPLWPLRP (SEQ ID NO:45),  
SWLPYPWHVPSS (SEQ ID NO:46), SWWTPWHVHSES (SEQ ID NO:47),  
SWAQHLSLPPVL (SEQ ID NO:48), SSSIIFPPWLSFF (SEQ ID NO:49),  
LNVPPSWFLSQR (SEQ ID NO:50), LDITPFLSLTLP (SEQ ID NO:51), LPHPVLHMGPLR  
(SEQ ID NO:52), VSKQPYYMWNGN (SEQ ID NO:53), NYTTYKSHFQDR (SEQ ID  
NO:54), AIPNNQLGFPPK (SEQ ID NO:55), NIENSTLATPLS (SEQ ID NO:56),  
YPYDANHTRSPT (SEQ ID NO:57), DPATNPGPHFPR (SEQ ID NO:58), TLPSPALLTVH  
(SEQ ID NO:59), HPGSPFPPEHRP (SEQ ID NO:60), TSHTDAPPARSP (SEQ ID NO:61),  
MTPSSLSTLPWP (SEQ ID NO:62), VLGQSGYLMPMR (SEQ ID NO:63), QPHITSPYLPS  
(SEQ ID NO:64), TPKTMTQTYDFS (SEQ ID NO:65), NSGTMQSASRAT (SEQ ID NO:66),  
QAASRVENYMR (SEQ ID NO:67), HQHKPPPLTNNW (SEQ ID NO:68),  
SNPWDSL SVST (SEQ ID NO:69), KTIEAHPPYYAS (SEQ ID NO:70),

EPDNWSLDFPRR (SEQ ID NO:71), HQHKPPPLTNNW (SEQ ID NO:72),  
GVVGKLGQRRTKKQRRQKK (SEQ ID NO:73),  
GRRTKKQRRQKKPPRYMILGLLALAAVCSAA (SEQ ID NO:74) and  
GRRTKKQRRQKKPP (SEQ ID NO:75).

31. (withdrawn) The expression cassette of claim 30 further comprising expression control sequences operatively linked to said DNA.

32. (withdrawn) A transfer vector comprising the expression cassette of claim 31.

33. (withdrawn) The expression cassette of claim 30, wherein said leader sequences are selected from the group consisting of IL-1ra, PTH, VP-22 and related sequences.

34. (withdrawn) The expression cassette of claim 30 wherein the protein of interest is selected from the group consisting of apoptotic protein, anti-apoptotic protein, cell cycle regulatory protein, transcription factor, suicide gene product, viral or tumor antigens, and cell proliferation factors.

35. (withdrawn) The expression cassette of claim 30, wherein the encoded fusion protein comprises an amino acid sequence which facilitates removal of leader sequences therefrom and wherein said leaderless fusion protein comprises an internalizing peptide and a protein of interest.

AP32573-AA 072396.0203  
PATENT

36. (withdrawn) The expression cassette of claim 30 wherein said fusion protein encoded thereby is produced and secreted from a cell and subsequently internalized into surrounding cells.

37. (withdrawn) A method for inducing synovial cell death comprising administering a peptide-cargo complex to said synovial cell.

38. (withdrawn) A method for inducing apoptosis in a tumor cell comprising administering a peptide-cargo complex to said tumor cell.

39. (withdrawn) A method for reducing white blood cells in arthritic joints comprising administering a peptide-cargo complex to said white blood cells.

40. (withdrawn) The method of claim 37, 38 or 39 wherein the peptide has an amino acid sequence selected from the group consisting of KRIQRILSRNS (SEQ ID NO:1), KRIHPRLTRSIR (SEQ ID NO:2), PPRLRKRRQLNM (SEQ ID NO:3), PIRRRKKLRRLK (SEQ ID NO:4), RRQRRTSKLMKR (SEQ ID NO:5), MHKRPTTPSRKM (SEQ ID NO:6), RQRSRRRPLNIR (SEQ ID NO:7), RIRMIQNLIKKT (SEQ ID NO:8), SRRKRQRSNMRI (SEQ ID NO:9), QRIRKSKISRTL (SEQ ID NO:10), PSKRL LHNNLRR (SEQ ID NO:11), HRHIRRQSLIML (SEQ ID NO:12), PQNRLQIRRHSH (SEQ ID NO:13), PPHNRIQRRLNM (SEQ ID NO:14), SMLKRNHSTSNR (SEQ ID NO:15), GSRHPSLIIPRQ (SEQ ID NO:16), SPMQKTMNLPPM (SEQ ID NO:17), NKRILIRIMTRP (SEQ ID NO:18), HGWZIHGLLHRA (SEQ ID NO:25), AVPAKKRZKSV (SEQ ID NO:26), PNTRVRPDVSF (SEQ ID NO:27), LTRNYEAWVFTP (SEQ ID NO:28), SAETVESCLAKSH (SEQ ID NO:29), YSHIATLPFTPT (SEQ ID NO:30), SYIQRTPSTTLP (SEQ ID NO:31), AVPAENALNNPF (SEQ ID NO:32),



AP32573-AA 072396.0203  
PATENT

SFHQFARATLAS(SEQ ID NO:33), QSPTDFTFPNPL (SEQ ID NO:34), HFAAWGGWSLVH  
(SEQ ID NO:35), HIQLSPFSQSWR (SEQ ID NO:36), LTMPSDLQPVLW (SEQ ID NO:37),  
FQPYDHPAEVSY (SEQ ID NO:38), FDPFFWKYSPRD (SEQ ID NO:39),  
FAPWDTASFMLG (SEQ ID NO:40), FTYKNFFWLPEL (SEQ ID NO:41),  
SATGAPWKMWVR (SEQ ID NO:42), SLGWMLPFSPPF (SEQ ID NO:43),  
SHAFTWPTYLQL (SEQ ID NO:44), SHNWLPLWPLRP (SEQ ID NO:45),  
SWLPYPWHVPSS (SEQ ID NO:46), SWWTPWHVHSES (SEQ ID NO:47),  
SWAQHLSLPPVL (SEQ ID NO:48), SSSIFPPWLSFF (SEQ ID NO:49),  
LNVPPSWFLSQR(SEQ ID NO:50), LDITPFLSLTLP (SEQ ID NO:51), LPHPVLHMGPLR  
(SEQ ID NO:52), VSKQPYYMWNGN (SEQ ID NO:53), NYTTYKSHFQDR (SEQ ID  
NO:54), AIPNNQLGFPPK (SEQ ID NO:55), NIENSTLATPLS (SEQ ID NO:56),  
YPYDANHTRSPT (SEQ ID NO:57), DPATNPGPHFPR (SEQ ID NO:58), TLPSPALLTVH  
(SEQ ID NO:59), HPGSPFPPEHRP (SEQ ID NO:60), TSHTDAPPARSP (SEQ ID NO:61),  
MTPSSLSTLPWP (SEQ ID NO:62), VLGQSGYLMPMR (SEQ ID NO:63), QPIITSPYLPS  
(SEQ ID NO:64), TPKTMTQTYDFS (SEQ ID NO:65), NSGTMQSASRAT (SEQ ID NO:66),  
QAASRVENYHR (SEQ ID NO:67), HQHKPPPLTNNW (SEQ ID NO:68),  
SNPWDSL SVST (SEQ ID NO:69), KTIEAHPYYAS (SEQ ID NO:70),  
EPDNWSLDFPRR(SEQ ID NO:71), HQHKPPPLTNNW (SEQ ID NO:72),  
GVVGKLGQRRTKKQRRQKK (SEQ ID NO:73),  
GRRTKKQRRQKKPPRYMILGLLALAAVCSAA (SEQ ID NO:74) and  
GRRTKKQRRQKKPP (SEQ ID NO:75).

AP32573-AA 072396.0203  
PATENT

41. (withdrawn) The method of claim 37, 38 or 39 wherein the cargo is an apoptotic protein.

42. (withdrawn) The method of claim 37, 38 or 39 wherein the apoptotic protein is selected from the group consisting of p53, caspase-3, HSV thymidine kinase and an antimicrobial peptide.

43. (withdrawn) The method of claim 41 wherein the antimicrobial peptide has an amino acid sequence selected from the group consisting of KLAKLAK (SEQ ID NO:22) and KLAKLAKKLAKLAK (SEQ ID NO:23).

44. (withdrawn) The method of claim 37, 38 or 39 wherein the peptide-cargo complex has an amino acid sequence RRQRRTSKLMKRGGKLAKLAKKLAKLAK (SEQ ID NO:24).

45. (withdrawn) A method for internalizing a GST-fusion protein into a cell comprising administering to said cell a peptide-cargo complex and a GST fusion protein.

46. (withdrawn) The method of claim 45 wherein the peptide has an amino acid sequence selected from the group consisting of KRIIQRILSRNS (SEQ ID NO:1), KRIHPRLTRSIR (SEQ ID NO:2), PPRLRKRRQLNM (SEQ ID NO:3), PIRRRKKLRRLK (SEQ ID NO:4), RRQRRTSKLMKR (SEQ ID NO:5), MHKRPTTPSRKM (SEQ ID NO:6), RQSRRRPLNIR (SEQ ID NO:7), RIRMIQNLIKKT (SEQ ID NO:8), SRRKRQRSNMRI (SEQ ID NO:9), QRIRKSKISRTL (SEQ ID NO:10), PSKRLHNNLRR (SEQ ID NO:11), HRHIRRQSLML (SEQ ID NO:12), PQNRLQIRRHKS (SEQ ID NO:13), PPHNRIQRRLNM (SEQ ID NO:14), SMLKRNHSTSNR (SEQ ID NO:15), GSRHPSLIIPRQ (SEQ ID NO:16),

AP32573-AA 072396.0203  
PATENT

SPMQKTMNLPPM (SEQ ID NO:17), NKRILIRIMTRP (SEQ ID NO:18), HGWZIHGLLHRA  
(SEQ ID NO:25), AVPAKKRZKSV (SEQ ID NO:26), PNTRVRPDVSF (SEQ ID NO:27),  
LTRNYEAWVPTP (SEQ ID NO:28), SAETVESCLAKSH (SEQ ID NO:29), YSHIATLPFTPT  
(SEQ ID NO:30), SYIQRTPSTTLP (SEQ ID NO:31), AVPAENALNNPF (SEQ ID NO:32),  
SFHQFARATLAS (SEQ ID NO:33), QSPTDFTFPNPL (SEQ ID NO:34), HFAAWGGWSLVH  
(SEQ ID NO:35), HIQLSPFSQSWR (SEQ ID NO:36), LTMPSDLQPVLW (SEQ ID NO:37),  
FQPYDHPAEVSY (SEQ ID NO:38), FDPFFWKYSPRD (SEQ ID NO:39),  
FAPWDTASEMLG (SEQ ID NO:40), FTYKNFFWLPEL (SEQ ID NO:41),  
SATGAPWKMWVR (SEQ ID NO:42), SLGWMLPFSPPF (SEQ ID NO:43),  
SHAFTWPTYLQL (SEQ ID NO:44), SHNWLPLWPLRP (SEQ ID NO:45),  
SWLPYPWHVPSS (SEQ ID NO:46), SWWTPWHVHSES (SEQ ID NO:47),  
SWAQHLSLPPVL (SEQ ID NO:48), SSSIFPPWLSFF (SEQ ID NO:49),  
LNVPPSWFLSQR (SEQ ID NO:50), LDITPFLSLTLP (SEQ ID NO:51), LPHPVLHMGPLR  
(SEQ ID NO:52), VSKQPYWMWNGN (SEQ ID NO:53), NYTTYKSHFQDR (SEQ ID  
NO:54), AIPNNQLGFPEK (SEQ ID NO:55), NIENSTLATPLS (SEQ ID NO:56),  
YPYDANHTRSPT (SEQ ID NO:57), DPATNPGPHFPR (SEQ ID NO:58), TLPSPALLTVH  
(SEQ ID NO:59), HPGSPFPPEHRP (SEQ ID NO:60), TSHTDAPPARSP (SEQ ID NO:61),  
MTPSSLSTLPWP (SEQ ID NO:62), VLGQSGYLMPMR (SEQ ID NO:63), QPHITSPYLPS  
(SEQ ID NO:64), TPKTMTQTYDFS (SEQ ID NO:65), NSGTMQSASRAT (SEQ ID NO:66),  
QAASRVENYMHK (SEQ ID NO:67), HQHKPPPLTNNW (SEQ ID NO:68),  
SNPWDSLLSVST (SEQ ID NO:69), KTIEAHPYYPAS (SEQ ID NO:70),  
EPDNWSLDFPRR (SEQ ID NO:71), HQHKPPPLTNNW (SEQ ID NO:72),  
GVVGKLGQRRITKKQRRQKK (SEQ ID NO:73),

AP32573-AA 072396.0203  
PATENT

GRRTKKQRRQKKPPRYMILGLLALAAVCSAA (SEQ ID NO:74) and  
GRRTKKQRRQKKPP (SEQ ID NO:75).

47. (withdrawn) The method of claim 45 wherein the cargo is glutathione.

48. (withdrawn) A kit for internalizing a GST-fusion protein into a cell  
comprising a peptide-cargo complex.

49. (withdrawn) The kit according to claim 48 wherein the peptide has the amino  
acid sequence selected from the group consisting of KRIIQRILSRNS (SEQ ID NO:1),  
KRIHPRLTRSIR (SEQ ID NO:2), PPRLRKRRQLNM (SEQ ID NO:3), PIRRRKKLRRLK  
(SEQ ID NO:4), RRQRRTSKLMKR (SEQ ID NO:5), MHKRPTTPSRKM (SEQ ID NO:6),  
RQRSRRRPLNIR (SEQ ID NO:7), RIRMIQNLIKKT (SEQ ID NO:8), SRRKRQRSNMRI  
(SEQ ID NO:9), QRIRKSKISRTL (SEQ ID NO:10), PSKRLLHNNLRR (SEQ ID NO:11),  
HRHIRRQSLIML (SEQ ID NO:12), PQNRLQIRRHSH (SEQ ID NO:13), PPHNRIQRRLNM  
(SEQ ID NO:14), SMLKRNHSTSNR (SEQ ID NO:15), GSRHPSLIIPRQ (SEQ ID NO:16),  
SPMQKTMNLPPM (SEQ ID NO:17), NKRLIRIMTRP (SEQ ID NO:18), HGWZIHGLLHRA  
(SEQ ID NO:25), AVPAKKRZKSV (SEQ ID NO:26), PNTRVRPDVSF (SEQ ID NO:27),  
LTRNYEAWVPTP (SEQ ID NO:28), SAETVESCLAKSH (SEQ ID NO:29), YSHIATLPFTPT  
(SEQ ID NO:30), SYIQRTPSTTLP (SEQ ID NO:31), AVPAENALNNPF (SEQ ID NO:32),  
SFHQFARATLAS (SEQ ID NO:33), QSPTDFTFPNPL (SEQ ID NO:34), HFAAWGGWSLVH  
(SEQ ID NO:35), HIQLSPFSQSWR (SEQ ID NO:36), LTMPSDLQPVLW (SEQ ID NO:37),  
FQPYDHAEVSY (SEQ ID NO:38), FDPFFWKYSPRD (SEQ ID NO:39),  
FAPWDTASFMLG (SEQ ID NO:40), FTYKNFFWLPEL (SEQ ID NO:41),

SATGAPWKMWVR (SEQ ID NO:42), SLGWMLPFSPFF (SEQ ID NO:43),  
SHAFTWPTYLQL (SEQ ID NO:44), SHNWLPLWPLRP (SEQ ID NO:45),  
SWLPYPWHVPSS (SEQ ID NO:46), SWWTPWHVHSES (SEQ ID NO:47),  
SWAQHLSLPPVL (SEQ ID NO:48), SSSIIPPWLSFF (SEQ ID NO:49),  
LNVPPSWFLSQR (SEQ ID NO:50), LDITPFLSLTLP (SEQ ID NO:51), LPHPVLHMGPLR  
(SEQ ID NO:52), VSKQPYWMWNGN (SEQ ID NO:53), NYTTYKSHFQDR (SEQ ID  
NO:54), AIPNNQLGFPEK (SEQ ID NO:55), NIENSTLATPLS (SEQ ID NO:56),  
YPYDANHTRSPT (SEQ ID NO:57), DPATNPGPHFPR (SEQ ID NO:58), TLPSPLALLTVH  
(SEQ ID NO:59), HPGSPFPPEHRP (SEQ ID NO:60), TSHTDAPPARSP (SEQ ID NO:61),  
MTPSSLSTLPWP (SEQ ID NO:62), VLGQSGYLMPMR (SEQ ID NO:63), QPIITSPYLPS  
(SEQ ID NO:64), TPKTMTQTYDFS (SEQ ID NO:65), NSGTMQSASRAT (SEQ ID NO:66),  
QAASRVENYMR (SEQ ID NO:67), HQHKPPPLTNNW (SEQ ID NO:68),  
SNPWDSL SVST (SEQ ID NO:69), KTIEAHPPYYAS (SEQ ID NO:70),  
EPDNWSLDFPRR (SEQ ID NO:71), HQHKPPPLTNNW (SEQ ID NO:72),  
GVVGKLGQRRTKKQRRQKK (SEQ ID NO:73),  
GRRTKKQRRQKKPPRYMILGLLALAAVCSAA (SEQ ID NO:74) and  
GRRTKKQRRQKKPP (SEQ ID NO:75).

50. (withdrawn) The kit according to claim 48 wherein the cargo is glutathione.

51. (withdrawn) An immunogen comprising a peptide-cargo complex wherein  
said peptide has an amino acid sequence selected from the group consisting of KRIIQRILSRNS  
(SEQ ID NO:1), KRIHPRLTRSIR (SEQ ID NO:2), PPRLRKRRQLNM (SEQ ID NO:3),  
PIRRRKLLRLK (SEQ ID NO:4), RRQRRTSKLMKR (SEQ ID NO:5), MHKRPTTPSRKM

AP32573-AA 072396.0203  
PATENT

(SEQ ID NO:6), RQSRRRPLNIR (SEQ ID NO:7), RIRMIQNLIKKT (SEQ ID NO:8),  
SRRKRQRSNMRI (SEQ ID NO:9), QRIRKSKISRTL (SEQ ID NO:10), PSKRLLHNNLRR  
(SEQ ID NO:11), HRHIRRQSLIML (SEQ ID NO:12), PQNRLQIRRHRSK (SEQ ID NO:13),  
PPHNRIQRRLNM (SEQ ID NO:14), SMLKRNHSTSNR (SEQ ID NO:15), GSRHPSLIIPRQ  
(SEQ ID NO:16), SPMQKTMNLPPM (SEQ ID NO:17), NKRILIRIMTRP (SEQ ID NO:18),  
HGWZIHGLLHRA (SEQ ID NO:25), AVPAKKRZKSV (SEQ ID NO:26), PNTRVRPDVSF  
(SEQ ID NO:27), LTRNYEAWVPTP (SEQ ID NO:28), SAETVESCLAKSH (SEQ ID NO:29),  
YSHIATLPFTPT (SEQ ID NO:30), SYIQRTPSTTLP (SEQ ID NO:31), AVPAENALNNPF  
(SEQ ID NO:32), SFHQFARATLAS (SEQ ID NO:33), QSPTDFTFPNPL (SEQ ID NO:34),  
HFAAWGGWSLVH (SEQ ID NO:35), HIQLSPFSQSWR (SEQ ID NO:36),  
LTMPSDLQPVLW (SEQ ID NO:37), FQPYDHPAEVSY (SEQ ID NO:38),  
FDPFFWKYSPRD (SEQ ID NO:39), FAPWDTASFMLG (SEQ ID NO:40), FTYKNFFWLPEL  
(SEQ ID NO:41), SATGAPWKMWVR (SEQ ID NO:42), SLGWMLPFSPPF (SEQ ID NO:43),  
SHAFTWPTYLQL (SEQ ID NO:44), SHNWLPLWPLRP (SEQ ID NO:45),  
SWLPYPWHVPSS (SEQ ID NO:46), SWWTPWHVHSES (SEQ ID NO:47),  
SWAQHLSLPPVL (SEQ ID NO:48), SSSIIPPWLSFF (SEQ ID NO:49),  
LNVPPSWFLSQR (SEQ ID NO:50), LDITPFLSLTLP (SEQ ID NO:51), LPHPVLHMGPLR  
(SEQ ID NO:52), VSKQPYWMWNGN (SEQ ID NO:53), NYTTYKSHFQDR (SEQ ID  
NO:54), AIPNNQLGFPPK (SEQ ID NO:55), NIENSTLATPLS (SEQ ID NO:56),  
YPYDANHTRSPT (SEQ ID NO:57), DPATNPGPHFPR (SEQ ID NO:58), TLPSPALLTVH  
(SEQ ID NO:59), HPGSPFPPEHRP (SEQ ID NO:60), TSHTDAPPARSP (SEQ ID NO:61),  
MTPSSLSTLPWP (SEQ ID NO:62), VLGQSGYLMPPMR (SEQ ID NO:63), QPIIITSPYLPS  
(SEQ ID NO:64), TPKTMTQTYDFS (SEQ ID NO:65), NSGTMQSASRAT (SEQ ID NO:66),

QAASRVENYMHHR (SEQ ID NO:67), HQHKPPPLTNNW (SEQ ID NO:68),  
SNPWDSLLSVST (SEQ ID NO:69), KTIEAHPPYYAS (SEQ ID NO:70),  
EPDNWSLDFPRR (SEQ ID NO:71), HQHKPPPLTNNW (SEQ ID NO:72),  
GVVGKLGQRRTKKQRRQKK (SEQ ID NO:73),  
GRRTKKQRRQKKPPRYMILGLLALAAVCSAA (SEQ ID NO:74) and  
GRRTKKQRRQKKPP (SEQ ID NO:75).

52. (withdrawn) The immunogen of claim 51 wherein the peptide has an amino acid sequence RRQRRTSKLMKR (SEQ ID NO:5).

53. (withdrawn) The immunogen of claim 51 wherein the peptide has an amino acid sequence GVVGKLGQRRTKKQRRQKK (SEQ ID NO:73).

54. (withdrawn) The immunogen of claim 51 wherein the cargo is selected from the group consisting of a polynucleotide, a polypeptide, a protein, a virus, a modified virus, a viral vector, and a plasmid.

55. (withdrawn) The immunogen of claim 51 wherein the cargo is an antigen.

56. (withdrawn) The immunogen of claim 51 wherein the cargo is an HIV protein selected from the group consisting of Gag, Pol, Env, Tat, Nef, Vpr, Vpv, Rev.

57. (withdrawn) A method for eliciting an immune response in a subject comprising administering to a target cell of said subject an immunogen comprising a peptide-cargo complex wherein said peptide has an amino acid sequence selected from the group consisting of KRRIQRILSRNS (SEQ ID NO:1), KRTHPRLTRSIR (SEQ ID NO:2),

AP32373-AA 072396.0203  
PATENT

PPRLRKRRQLNM (SEQ ID NO:3), PIRRRKKLRRLK (SEQ ID NO:4),  
RRQRRTSKLMKR (SEQ ID NO:5), MHKRPTTPSRKM (SEQ ID NO:6), RQSRRRPLNIR  
(SEQ ID NO:7), RIRMIQNLIKKT (SEQ ID NO:8), SRRKRQRSNMRI (SEQ ID NO:9),  
QRIRKSKISRTL (SEQ ID NO:10), PSKRLHNNLRR (SEQ ID NO:11), HRHIRRQSLIML  
(SEQ ID NO:12), PQNRLQIRRHSH (SEQ ID NO:13), PPHNRIQRRLNM (SEQ ID NO:14),  
SMLKRNHSTSNR (SEQ ID NO:15), GSRHPSLIIPRQ (SEQ ID NO:16), SPMQKTMNLPPM  
(SEQ ID NO:17), NKRILIRIMTRP (SEQ ID NO:18), HGWZIHGLLHRA (SEQ ID NO:25),  
AVPAKKRZKSV (SEQ ID NO:26), PNTRVRPDVSF (SEQ ID NO:27),  
LTRNYEAWVPTP (SEQ ID NO:28), SAETVESCLAKSH (SEQ ID NO:29), YSHIATLPFTPT  
(SEQ ID NO:30), SYIQRTPSTTLP (SEQ ID NO:31), AVPAENALNNPF (SEQ ID NO:32),  
SFHQFARATLAS (SEQ ID NO:33), QSPTDFTFPNPL (SEQ ID NO:34), HFAAWGGWSLVH  
(SEQ ID NO:35), HIQLSPFSQSWR (SEQ ID NO:36), LTMPSDLQPVLW (SEQ ID NO:37),  
FQPYDHAEVSY (SEQ ID NO:38), FDPFFWKYSPRD (SEQ ID NO:39),  
FAPWDTASFMLG (SEQ ID NO:40), FTYKNFFWLPEL (SEQ ID NO:41),  
SATGAPWKMWVR (SEQ ID NO:42), SLGWMLPFSPPF (SEQ ID NO:43),  
SHAFTWPTYLQL (SEQ ID NO:44), SHNWLPLWPLRP (SEQ ID NO:45),  
SWLPYPWHVPSS (SEQ ID NO:46), SWWTPWHVHSES (SEQ ID NO:47),  
SWAQHLSLPPVL (SEQ ID NO:48), SSSIFPPWLSFF (SEQ ID NO:49),  
LNVPPSWFLSQR (SEQ ID NO:50), LDITPFLSLTLP (SEQ ID NO:51), LPHFVLHMGPLR  
(SEQ ID NO:52), VSKQPYWMWNGN (SEQ ID NO:53), NYTTYKSHFQDR (SEQ ID  
NO:54), AIPNNQLGFPPK (SEQ ID NO:55), NIENSTLATPLS (SEQ ID NO:56),  
YPYDANHTRSPT (SEQ ID NO:57), DPATNPGPHFPR (SEQ ID NO:58), TLPSPLALLTVH  
(SEQ ID NO:59), HPGSPFPPEHRP (SEQ ID NO:60), TSHTDAPPARSP (SEQ ID NO:61),



AP32573-AA 072396.0203  
PATENT

MTPSSLSTLPWP (SEQ ID NO:62), VLGQSGYLMPMR (SEQ ID NO:63), QPIIITSPYLPS (SEQ ID NO:64), TPKTMTQTYDFS (SEQ ID NO:65), NSGTMQSASRAT (SEQ ID NO:66), QAASRVENYMR (SEQ ID NO:67), HQHKPPPLTNNW (SEQ ID NO:68), SNPWDSLLSVST (SEQ ID NO:69), KTIEAHPPYYAS (SEQ ID NO:70), EPDNWSLDFPRR (SEQ ID NO:71), HQHKPPPLTNNW (SEQ ID NO:72), GVVGKLGQRRTKKQRRQKK (SEQ ID NO:73), GRRTKKQRRQKKPPRYMILGLLALAAVCSAA (SEQ ID NO:74) and GRRTKKQRRQKKPP (SEQ ID NO:75).

58. (withdrawn) The method of claim 57 wherein the target cell is a mucosal cell.

59. (withdrawn) The method of claim 58 wherein the mucosal cell is a cervical mucosal cell.

60. (new) A peptide having an amino acid sequence selected from the group consisting of PIRRRKKLRLK (SEQ ID NO:4); RRQRRTSKLMKR (SEQ ID NO:5); SRRKRQRSNMRI (SEQ ID NO:9); SFHQFARATLAS (SEQ ID NO:33); DPATNPGPHFPR (SEQ ID NO:58); and TLPSPLALLTVH (SEQ ID NO:59).

61. (new) The peptide of claim 60 wherein said peptide facilitates cellular internalization of a cargo linked thereto.

62. (new) The peptide of claim 61 wherein the peptide is PIRRRKKLRLK (SEQ ID NO:4).

63. (new) The peptide of claim 61 wherein the peptide is RRQRRTSKLMKR  
(SEQ ID NO:5).

64. (new) The peptide of claim 61 wherein the peptide is SRRKRQRSNMRI  
(SEQ ID NO:9).

65. (new) The peptide of claim 61 wherein the peptide is SFHQFARATLAS  
(SEQ ID NO:33).

66. (new) The peptide of claim 61 wherein the peptide is DPATNPGPHFPR  
(SEQ ID NO:58).

67. (new) The peptide of claim 61 wherein the peptide is TLPSPALLTVH  
(SEQ ID NO:59).

68. (new) The peptide of claim 60 wherein the peptide provides for nuclear  
translocation in a target cell.

69. (new) A peptide-cargo complex comprising a peptide and a cargo wherein  
the peptide has an amino acid sequence selected from the group consisting of PIRRRKKLRLK  
(SEQ ID NO:4), RRQRRTSKLMKR (SEQ ID NO:5), SRRKRQRSNMRI (SEQ ID NO:9),  
SFHQFARATLAS (SEQ ID NO:33), DPATNPGPHFPR (SEQ ID NO:58), and  
TLPSPALLTVH (SEQ ID NO:59).

70. (new) The peptide-cargo complex of claim 69 wherein the cargo is selected  
from the group consisting of a polynucleotide, a polypeptide, a small molecule, a virus, a  
modified virus, a viral vector, and a plasmid.

71. (new) The peptide-cargo complex of claim 70 wherein the cargo is a virus selected from the group consisting of adenovirus, adeno-associated virus, herpes simplex virus, and retrovirus.

72. (new) The peptide-cargo complex of claim 69 wherein the cargo is selected from the group consisting of therapeutic proteins, suicide proteins, tumor suppressor proteins, transcription factors, kinase inhibitors, kinases, cell cycle regulatory proteins, apoptotic proteins, anti-apoptotic proteins, viral antigens, cellular antigens, differentiation factors, immortalization factors and toxins.

73. (new) The peptide-cargo complex of claim 69 wherein the peptide facilitates cellular internalization of cargo linked thereto.

74. (new) The peptide-cargo complex of claim 73 wherein the peptide provides for nuclear translocation of said peptide-cargo complex in a target cell.

75. (new) The peptide-cargo complex of claim 69 wherein the peptide has the amino acid sequence PIRRRKKLRRLK (SEQ ID NO:4).

76. (new) The peptide-cargo complex of claim 69 wherein the peptide has the amino acid sequence RRQRRTSKLMKR (SEQ ID NO:5).

77. (new) The peptide-cargo complex of claim 69 wherein the peptide has the amino acid sequence SRRKRQRSNMRI (SEQ ID NO:9).

78. (new) The peptide-cargo complex of claim 69 wherein the peptide has the amino acid sequence SFHQFARATLAS (SEQ ID NO:33).

AP32573-AA 072396.0203  
PATENT

79. (new) The peptide-cargo complex of claim 69 wherein the peptide has the amino acid sequence DPATNPGPHFPR (SEQ ID NO:58).

80. (new) The peptide-cargo complex of claim 69 wherein the peptide has the amino acid sequence TLPSPALLTVH (SEQ ID NO:59).

81. (new) The peptide-cargo complex of claim 69 wherein the peptide is biotinylated and the cargo is avidin labeled.

82. (new) The peptide-cargo complex of claim 72, wherein the cargo is an apoptotic protein selected from the group consisting of p53, caspase-3, HSV thymidine kinase and an antimicrobial peptide.

83. (new) The peptide-cargo complex of claim 82, wherein the cargo is an antimicrobial peptide selected from the group consisting of KLAKLAK (SEQ ID NO:22) and KLAKLAKKLAKLAK (SEQ ID NO:23).

84. (new) The peptide-cargo complex of claim 82 having an amino acid sequence RRQRRTSKLMKRGGKLAKLAKKLAKLAK (SEQ ID NO:24).

85. (new) The peptide-cargo complex of claim 69 wherein the cargo is glutathione.

86. (new) A method for inducing synovial cell death comprising administering a peptide-cargo complex to said synovial cell wherein the peptide has an amino acid sequence selected from the group consisting of PIRRRKKLRRLK (SEQ ID NO:4), RRQRRTSKLMKR

AP32573-AA 072396.0203  
PATENT

(SEQ ID NO:5), SRRKRQRSNMRI (SEQ ID NO:9), SFHQFARATLAS (SEQ ID NO:33),  
DPATNPGPHFPR (SEQ ID NO:58) and TLPSPALLTVH (SEQ ID NO:59).

87. (new) The method of claim 86 wherein the cargo is an apoptotic protein.

88. (new) The method of claim 86 wherein the apoptotic protein is selected from  
the group consisting of p53, caspase-3, HSV thymidine kinase and an antimicrobial peptide.

89. (new) The method of claim 88 wherein the antimicrobial peptide has an  
amino acid sequence selected from the group consisting of KLAKLAK (SEQ ID NO:22) and  
KLAKLAKKLAKLAK (SEQ ID NO:23).

90. (new) The method of claim 86 wherein the peptide-cargo complex has an  
amino acid sequence RRQRRTSKLMKRGGKLAKLAKKLAKLAK (SEQ ID NO:24).